Validation of TRMM 3B42 V6 for estimation of mean annual rainfall over ungauged area in semiarid climate

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ABSTRACT

This research compares data from the Tropical Rainfall Measuring Mission 3B42 V6 with data obtained from 19 synoptic rain gauges during the period 1998–2010 over the semiarid climate of Khorasan Razavi, Iran. Validation was performed using three spatial extents, including 1 TRMM grid face from the synoptic station (1PTRM), 3 TRMM points surrounding the synoptic station (3PTRM) and 5 TRMM points surrounding the synoptic station (5PTRM), using ArcGIS 10.2 software. The perfect and poor *r* were obtained at stations S08 and S19, with values of 0.92 and 0.26, respectively. According to the Nash–Sutcliffe efficiency coefficient, the TRMM satellite can predict the spatial variation of the mean annual rainfall by 0.23, 0.43 and 0.38 for 1PTRM, 3PTRM and 5PTRM, respectively, at 19 stations. The agreement significantly increases by 0.88, 0.83 and 0.80 for 1PTRM, 3PTRM and 5PTRM, respectively, when gauges S05, S07, S11 and S13 are excluded from the dataset, which may be associated with orographic or instrumental error at the stations.

KEYWORDS

Khorasan; Mean annual rainfall; Semiarid; TRMM V6

ACKNOWLEDGEMENT

The authors would like to thank the Mashhad Meteorological Organization of Iran, for providing the synoptic rain gauge data and NASA, USA, for providing free access to the TRMM data. This work was supported by the University of Malaysia, Pahang, under internal Grant Number RDU150127.